

REMARKS

Reconsideration and allowance of the subject application are respectfully requested. Claims 1-4 and 6-29 are pending in the present application, claims 1, 11, 14, 15, and 19 being independent. Claims 1 and 13 have been amended and claims 14 and 15 have been added.

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Drawings

Applicants appreciate the Examiner acceptance of the submitted drawings of 2 May 2000.

Foreign Priority

Applicants appreciate the Examiner's acknowledgement of foreign priority however the Examiner has again incorrectly acknowledged the wrong application. In our 25 July 2000 submission to the Examiner (Japanese Language Declaration and Power of Attorney, pg.2), a copy contained herein, the Applicants have listed two prior foreign applications but indicated only that JP 2000-044511, filed 22 February 2000, is to be the claimed priority document. Therefore Applicants request that the Examiner acknowledge JP 2000-044511 as the Applicant's submission of priority under 35 U.S.C. § 119(a)-(d).

Rejection Under 35 U.S.C. § 112, Second Paragraph

Claim 13 stands rejected under 35 U.S.C. § 112-second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention. This rejection is respectfully traversed.

Applicants direct the Examiner's attention to amended claim 13 where "a two-sided reflective layer on one surface" has been replaced by "a two-sided reflective coating on a transparent substrate." Claim 13 has been amended to clarify the intended scope of claim 13. The scope of which is supported by Figure 25 showing a two-sided reflecting surface 139 (specification, page 37, lines 14-17).

In light of Figure 25 and the specification, claim 13 clearly falls within an interpretation that would be given by one having ordinary skill in the art.

In view of the above, applicants respectfully request reconsideration and withdrawal of the outstanding rejections under 35 U.S.C. § 112-second paragraph.

Prior Art Rejections

1. Rejection under 35 U.S.C. § 102 (b) based on Shih

Claims 1, 3, 16, and 17 stand rejected under 35 U.S.C. §102(b) as being anticipated by *Shih* (U.S. Patent No. 5,684,812). This rejection is respectfully traversed.

The invention defined by amended independent claim 1 has a first and a second ridge line that are substantially orthogonal to each other. In addition the reflection order of the laser beam off of the reflective surfaces, expressed as numbers, is 1-2-3-4-2-1-4-3 and contains a laser medium between said first reflecting surface and said third reflecting surface, where three reflections occur without passing through the laser medium. *Shih* fails to disclose a device where the reflected laser beam makes three consecutive reflections without passing through the laser medium.

Shih describes a laser resonator (*Shih*, Figure 9) having two roof-top mirrors 422 and 423, a resonator cavity 410, and partially transmissive mediums 424 and 425. The

roof-top mirror 422 flips the anti-symmetric resonance mode in a vertical manner and the roof top mirror 423 horizontally flips the anti-symmetric mode as the beams travel through the glossy mediums 424 and 425 (Shih, col. 7, ll. 3-19). Shih shows a system where the resonator cavity extends the region between roof-top mirrors 422 and 423 (Shih, Figure 9).

As is clearly shown in Shih, Figure 9, the light leaving the resonator fails to be reflected such that the reflection order of the laser beam off of the reflective surfaces, expressed as numbers, is 1-2-3-4-2-1-4-3. The light leaving the resonator in Shih has no particular reflection order and certainly does not allow three reflections to occur without passing through the laser medium.

For anticipation under 35 U.S.C. § 102 "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Verdegaal Bros. v. Union Oil Co. of California 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987)(M.P.E.P. 2131).

Applicants have already explained why Shih fails to teach or suggest the invention of independent claim 1. Since claims 3, 16, and 17 each depend, either directly or indirectly, from claim 1, claims 3, 16, and 17 are allowable at least for the reasons generally expressed above with respect to claim 1.

In view of the above, Applicants respectfully request reconsideration and withdrawal of the outstanding rejection under 35 U.S.C. § 102 based on *Shih*.

2. Rejection under 35 U.S.C. § 103 (a) based on *Shih* and *Sasser*

Claims 10-15, 18, 20, 28, and 29 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Shih* in view of *Sasser* (U.S. Patent 4,677,639) and claims 19

and 21 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Sasser in view of Shih. This rejection is respectfully traversed.

Independent claims 11, 14, and 15 contain first and second reflecting apparatus's that have ridge lines substantially orthogonal, and has a laser medium where three reflections of a laser beam occur without passing through the laser medium. Claim 11 further contains a third reflecting apparatus having parallel reflective surfaces, positioned between the first and second reflecting apparatus resulting in a reflection of a laser beam in the reflection order off of the reflecting surfaces, expressed as numbers, of 1-2-3-4-5-4-3-2-1-3-4-1-2-6-2-1-4-3. Claims 14 further contains a two sided reflecting surface ("seventh" reflecting surface) position near the laser medium such that the reflection order of the laser beam off of the reflective surfaces, expressed as numbers, is 1-2-3-4-2-1-4-3-7-3-4-1-2-4-3-2-1. Claim 15 further contains a two-sided reflective optical element ("eighth") positioned so that the beam reflective order of the laser beam off of reflective surfaces, expressed as numbers is 1-2-3-4-8 and back again in reverse order 4-3-2-1, then 3-4-1-2-8-2-1-4-3.

Claim 19 is directed to a self-compensating laser resonator having a first and second prism and a two-sided reflecting surface. The two-sided reflecting surface is positioned on the second prism where the laser beam is incident. A first and second ridge line of the first and second prisms respectively are substantially orthogonal, further containing a laser medium. The reflective order of the laser beam off of the reflective surfaces, expressed as numbers, is 1-2-3-4-2-1-9-14-3-2-1-3-4-9-4-3, where three reflections of a laser beam occur without passing through the laser medium.

Sasser describes a laser resonator having two Porro prisms 172 and 173 (Figure 10) aligned such that their respective ridge lines are parallel (col. 11, ll. 44-50; col. 12, ll. 10-20). Sasser further describes a system using two corner prisms 124 and 125 (Figure 9; col. 9, ll. 52-53). The ridge lines of the corner prisms are not substantially orthogonal (Figure 9). The reflective order of the laser beam off of the reflecting surfaces, expressed as numbers, shown in Sasser is 1-2-3-4-5-6.

As discussed above with respect to claim 1, Shih fails to disclose any particular reflection order of the laser beam leaving the laser medium. Thus Shih fails to contain an elements of claims 11, 14, 15, and 19, which contain particular reflection orders.

Sasser likewise fails to show the reflective order of claims 1, 14, 15, and 19. For example claim 11 has an order of reflection of the laser beam emanating from the laser medium of 1-2-3-4-5-4-3-2-1-3-4-1-2-6-2-1-4-3. Sasser shows an order of reflection of the laser beam emanating from the laser medium of 1-2-3-4-3-2-1-5-6-7-8-7-6-5. The present invention defined by claims 11, 14, 15, and 19 has obvious advantages over Sasser, the first being that Sasser uses prisms which will inherently disperse the laser beam, the second being that the reflection order of the present invention defined by claims 11, 14, 15, and 19 maximizes the path lengths for the laser beams reflecting off of the reflective surfaces that are at right angles to each other, features of which are not shown in Sasser nor Shih.

To establish a *prima facie* case obviousness under 35 U.S.C. § 103, the Examiner has the burden of meeting the following three basic criteria: (1) the prior art must teach or suggest all of the claim limitations; (2) there must be a reasonable expectation of success; and (3) there must be some suggestion or motivation, either in

the art or knowledge generally available to one of ordinary skill in the art to modify the reference or to combine teachings (M.P.E.P. § 2143)(emphasis added).

Since claims 10, 12, 13, 18, 20, 28, and 29 each depend directly or indirectly from independent claims 11, 14, 15, and 19, and *Shih* in view of *Sasser* fails to satisfy the *prima facie* requirement under 35 U.S.C. § 103 in regards to independent claims 11, 14, 15, and 19, *Shih* in view of *Sasser* likewise fails to satisfy the *prima facie* requirement under 35 U.S.C. § 103 for dependent claims 10, 12, 13, 18, 20, 28, and 29 for the same reasons as for independent claims 11, 14, 15, and 19.

In view of the above, Applicants respectfully request reconsideration and withdrawal of the outstanding rejection of claims 10-15, 18-21, 28, and 29 under 35 U.S.C § 103(a).

CONCLUSION

In view of the above amendments and remarks, Applicants respectfully request reconsideration and withdrawal of the formal objections and rejections to the claims, and the rejections based on prior art. Because all claims are believed to define over prior art of record, Applicants respectfully request an early indication of allowability.

If the Examiner has any questions concerning this application, the Examiner is requested to contact the undersigned at (703) 205-8000 in the Washington, D.C. area.

Pursuant to 37 C.F.R. §§ 1.17 and 1.136(a), Applicant(s) respectfully petition(s) for a one (1) month extension of time for filing a reply in connection with the present application, and the required fee of \$110.00 is attached hereto.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayments to Deposit Account No.

02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,
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**MARKED UP VERSION TO SHOW CHANGES MADE
IN THE CLAIMS**

The claims have been amended as follows:

1. (Twice Amended) A self-compensating laser resonator comprising:
 - a first reflecting apparatus having a first reflecting surface and a second reflecting surface disposed at a right angle to each other and intersecting at a first ridge line;
 - a second reflecting apparatus having a third reflecting surface and a fourth reflecting surface disposed at a right angle to each other and intersecting at a second ridge line, said second reflecting apparatus facing said first reflecting apparatus such that the first through fourth reflecting surfaces are facing each other; and
 - a laser medium provided between said first reflecting surface and said third reflecting surface; and
 - a light source for exciting said laser medium

wherein [a] the first ridge line [formed by the intersection of said first and second reflecting surfaces,] is substantially orthogonal to [a] the second ridge line [formed by the intersection of said third and fourth reflecting surfaces], where a laser beam emanating from said laser medium travels along an optical path to said first reflecting surface and is successively reflected, along an optical path, by said first, second, third, fourth, second, first, fourth and third reflecting surfaces to again enter said laser medium, said laser medium being positioned with respect to said first and second reflecting apparatus so that three reflections occur without the laser beam emitted therefrom passing through the laser medium.

13. (Amended) A self-compensating laser resonator according to Claim 11,
wherein said third reflecting apparatus comprises a reflecting mirror having a two-sided
reflective coating [layer] on [one surface] a transparent substrate.

Claims 14 and 15 have been added.